

Appl. Ser. No. 09/786,903

Att. Docket No. 10191/1714

Reply to Office Action of July 16, 2003

REMARKS

Claims 20 to 29 are added, and therefore claims 10 to 29 are pending.

Claims 10 and 19 have been amended. Support for the amendments is found in the specification, including at least at page 6, line 34 to page 7, line 3, and at least at page 8, lines 16 to 31, respectively.

Applicants thank the Examiner for acknowledging receipt of the marked-up version of the substitute specification.

Applicants respectfully request the Examiner to reconsider the above-captioned application in view of the following remarks.

As suggested by the Examiner, the specification has been corrected to correct a spelling informality.

Claims 10 to 19 stand rejected under 35 U.S.C. § 112, first paragraph, as lacking enablement.

As regards claim 10 as presented, it provides that the first measuring electrode included a cermet electrode with at least one metal oxide component, the at least one metal oxide component being capable of reversible incorporation of oxygen, and further provides that the cermet includes a metallic component and a ceramic component. As described in the specification, at least the “first measuring electrode is a cermet electrode, where at least one metal oxide component of the cermet electrode is capable of reversible incorporation of oxygen, the potential of this first measuring electrode is kept almost constant in the range around $\lambda \approx 1$.” See Specification, page 4, lines 29 to 31. Accordingly, it is respectfully submitted that the specification is enabling as to each of the claims.

As regards claim 14, which provides that the sensor includes a porous layer and that “the solid electrolyte being integrated into the porous layer”, it is respectfully submitted that the disclosure is adequate. As described in the specification, “[o]ne layer between the two measuring electrodes must be sufficiently porous so that it allows a sufficiently rapid establishment of an equilibrium in the constantly changing concentrations of the individual exhaust gas components” (see Specification, page 5, lines 25 to 29), so that the claims are enabled.

As regards claim 15, it provides that “the porous layer contains at least one of

promoters and catalysts at least in some areas". As described in the specification, "additional promoters or catalysts that support the establishment of an equilibrium may be incorporated into layer 18. In this way it is possible to vary the composition of equilibrium electrode 16 to a great extent". See Specification, page 9, lines 12 to 16. Accordingly, it is respectfully submitted that the claims are enabled.

As regards claim 19, as presented, it provides that "a potential of $\lambda = 1$ is applied when a λ value of < 1 is present in the gas mixture." As described in the specification, in "an operating mode of internal combustion engine where $\lambda \approx 1$, the oxygen concentration directly at a surface of mixed potential electrode 14 is kept almost constant due to the added metal oxide components. A capacity for incorporation and disincorporation of oxygen in a mixed potential electrode 14 determines a λ range in which the potential of mixed potential electrode 14 is almost constant. However, the potential on equilibrium electrode 16 in such an operating mode of the internal combustion engine is exposed to great variations, because there are great variations in oxygen concentration precisely in such a λ range. Thus at $\lambda \approx 1$, mixed potential electrode 14 can be used as a reference electrode, while equilibrium electrode 16 can be used as a working electrode 16. Then a detection voltage U which is a direct measure of the oxygen concentration of the gas mixture can be picked off via electrochemical measuring cell 12." See Specification, page 8, lines 16 to 31. Accordingly, it is respectfully submitted that the claims are enabled.

In view of at least the foregoing, it is respectfully submitted that claims 10 to 19 satisfy the enabling requirement of 35 U.S.C. § 112, first paragraph.

Claims 10 to 19 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite. It is respectfully submitted that the pending claims satisfy 35 U.S.C. § 112, second paragraph, for at least the following reasons.

As regards claim 10, it provides that the first measuring electrode includes a cermet electrode. The remarks discussed herein as to the cermet feature of claim 10 and as regards the enablement rejections are also referred to here as to the indefiniteness rejections. Also, as described in the specification, "at least the first measuring electrode is a cermet electrode, where at least one metal oxide component of the cermet electrode is capable of reversible incorporation of oxygen, the potential of this first measuring electrode is kept almost constant

in the range around $\lambda \approx 1$." See Specification, page 4, lines 29 to 31.

As regards claim 14, the Office Action indicates that the recited language directed to integration of the solid electrolyte into the porous layer is mis-descriptive. Respectfully, the Specification clearly describes that there may be multiple layers. See Specification, page 5, lines 17 to 32.

As regards claim 19, the Office Action indicates that claim 19 is not a proper dependent claim and that the wording of claim 19 is mis-descriptive. It is respectfully submitted that claim 19 is a proper dependent claim and that support for claim 19 may be found in the specification, page 8, lines 16 to 31, such that the voltage is applied at the first measuring electrode (14).

In view of at least the foregoing, it is respectfully submitted that the claims are definite.

Claims 10, 14, 15 and 19 stand rejected under 35 U.S.C. § 102(e) as anticipated by the Kohler reference.

To anticipate a claim under § 102, a single prior art reference must identically describe each and every claim feature. See Lindeman Maschinenfabrik v. American Hoist and Derrick, 730 F.2d 1452, 1458 (Fed. Cir. 1984). If any claimed element is absent from a prior art reference, it cannot anticipate the claim. See Rowe v. Dror, 112 F.3d 473, 478 (Fed. Cir. 1997). Anticipation requires the presence in a single prior art reference disclosure of each and every claim feature, *arranged as in the claim*. Lindeman, 703 F.2d 1458 (Emphasis added).

An electrochemical measuring cell includes two electrodes as well as a solid electrolyte by which the two electrodes are electrically connected. If the two electrodes are at a different potential, electrical field lines form between the two electrodes which run through the solid electrolyte. Consequently, between the two electrodes, at an appropriate amperometric wiring configuration along the field lines, load carriers (oxygen ions), and thus a current, can flow. In the case of an potentiometric wiring configuration, a potential difference is formed, which develops between the two electrodes. The assumption for the amperometric and the potentiometric operation of the measuring cell is in each case that the two electrodes are electrically connected by the solid electrolyte. The sensor described in the

Application (Figure 1) is constructed so that in response to the appropriate wiring configuration, in which two of the three electrodes are able to form an electrochemical measuring cell with each other. Which of the electrodes are used to provide the electrochemical cell is defined by the operating procedure.

In view of the foregoing, in claim 10 as presented, the first measuring electrode contains a cermet, the cermet includes a metallic component and a ceramic component, and the ceramic component includes a metal oxide. This corresponds directly to the definition of a cermet, and also to the comments in the Office Action. It should be understood that the admixture of gold or silver, for example, to the cermet means that gold or silver are added to the electrode material as further metallic components -- in addition to the metallic component (and the metal oxide component) of the cermet, as is clarified in claim 10 as presented.

In the Kohler reference, an electrode is exclusively made of a metal oxide. The assertions of the Office Action that the metal oxide is doped with a noble metal (probably concerning column 3, lines 40 through 45) and that consequently, besides the metal oxide, it also has a metallic component are not supported. In particular, the Kohler reference indicates that in the metal oxide SmTiNiNbO_6 , nickel is *replaced* by platinum or palladium. The material resulting in such a manner is, of course, still a metal oxide, such as, for example, SmTiPtNbO_6 , which does not have a metallic component any more than does SmTiNiNbO_6 .

In view of at least the above discussion, Applicants respectfully submit that Kohler does not anticipate claim 10, so that claim 10 is allowable, as are its dependent claims 14, 15 and 19.

Claims 10, 12, 13 and 19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the Fukushima reference. It is respectfully submitted that claims 10, 12, 13 and 19 are not rendered obvious by the Fukushima reference for at least the following reasons.

For a claim to be rejected for obviousness under 35 U.S.C. § 103(a), the prior art must teach or suggest each element of the claim. See Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934 (Fed. Cir. 1990), cert. denied, 111 S. Ct. 296 (1990); In re Bond, 910 F.2d 831, 834 (Fed. Cir. 1990). Applicants respectfully submit that these criteria for obviousness are not met here.

The Fukushima reference refers to an electrode that is a cermet having MnO_2 as the

metal oxide and Ag as the metallic component. However, this electrode is “semicatalytic”, which means that its catalytic activity amounts to approximately one-half that of a noble metal electrode. According to claim 10, however, the first measuring electrode has substantially no catalytic effect on an establishment of an equilibrium. The different properties of the electrode of claim 10 and the electrode of Fukushima can also be inferred directly from the fact that, using the electrode of Fukushima, exclusively the oxygen content is measured (a certain catalytic activity is required for the determination of the oxygen concentration). In contrast, the sensor of claim 10 is able to determine both oxygen and an oxidizable gas component. In this regard, in claim 10 as presented, the “sensor is able to determine a concentration of an oxidizable component in the gas mixture”.

As further regard the obviousness rejections, to reject a claim as obvious under 35 U.S.C. § 103, the prior art must disclose or suggest each claim element and it must also provide a motivation or suggestion for combining the elements in the manner contemplated by the claim. (See Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 934 (Fed. Cir. 1990), cert. denied, 111 S. Ct. 296 (1990); In re Bond, 910 F.2d 831, 834 (Fed. Cir. 1990)). Thus, the “problem confronted by the inventor must be considered in determining whether it would have been obvious to combine the references in order to solve the problem”, Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 679 (Fed. Cir. 1998). The prior art simply does not address the problems met by the subject matter of any of the rejected claims.

The cases of In re Fine, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988), and In re Jones, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992), also make plain that the Office Action’s assertions that it would have been obvious to modify the reference relied upon does not properly support a § 103 rejection. It is respectfully suggested that those cases make plain that the Office Action reflects a subjective “obvious to try” standard, and therefore does not reflect the proper evidence to support an obviousness rejection based on the references relied upon. In particular, the Court in the case of In re Fine stated that:

Instead, the Examiner relies on hindsight in reaching his obviousness determination. . . . **One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.**

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In re Fine, 5 U.S.P.Q.2d at 1600 (citations omitted; emphasis added). Likewise, the Court in the case of In re Jones stated that:

Before the PTO may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. . . .

Conspicuously missing from this record is any evidence, other than the PTO's speculation (if it be called evidence) that one of ordinary skill . . . would have been motivated to make the modifications . . . necessary to arrive at the claimed [invention].

In re Jones, 21 U.S.P.Q.2d at 1943 & 1944 (citations omitted; italics in original).

That is exactly the case here since it is respectfully submitted that the Office Action reflects hindsight, reconstruction and speculation, which these cases have indicated does not constitute evidence that will support a proper obviousness finding.

More recently, the Federal Circuit in the case of In re Kotzab has made plain that even if a claim concerns a “technologically simple concept” -- which is not even the case here, there still must be some finding as to the “specific understanding or principle within the knowledge of a skilled artisan” that would motivate a person having no knowledge of the claimed subject matter to “make the combination in the manner claimed”, stating that:

In this case, the Examiner and the Board fell into the hindsight trap. The idea of a single sensor controlling multiple valves, as opposed to multiple sensors controlling multiple valves, is a technologically simple concept. *With this simple concept in mind, the Patent and Trademark Office found prior art statements that in the abstract appeared to suggest the claimed limitation. But, there was no finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of Kotzab's invention to make the combination in the manner claimed.* In light of our holding of the absence of a motivation to combine the teachings in Evans, we conclude that the Board did not make out a proper *prima facie* case of obviousness in rejecting [the] claims . . . under 35 U.S.C. Section 103(a) over Evans.

(See In re Kotzab, 55 U.S.P.Q.2d 1313, 1318 (Federal Circuit 2000) (italics added)).

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As referred to above, any review of the references, whether taken alone or combined, makes plain that they simply do not describe the features discussed above of the rejected claims. Thus, the proper evidence of obviousness must show why there is a suggestion to combine the references so as to provide the subject matter of the claims and its benefits.

In view of the foregoing, it is respectfully submit that Fukushima does not render claim 10 obvious, so that claim 10 is allowable, as are its dependent claims 12, 13 and 19.

New claims 20 to 29 do not add any new matter and are supported in the specification. Claims 20 to 29 depend from claim 10, and are therefore allowable for the same reasons as claim 10.

Accordingly, claims 10 to 29 are allowable.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that claims 10 to 29 are in condition for allowance, and it is therefore respectfully requested that any objections and rejections be withdrawn. Prompt reconsideration and allowance of the present application are therefore respectfully requested.

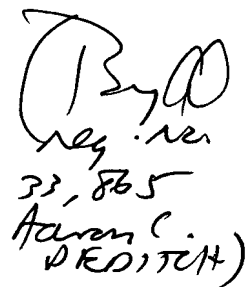
Respectfully submitted,
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